

YOSHIMURA, GWEN

From: YOSHIMURA, GWEN
Sent: Wednesday, July 31, 2013 10:34 AM
To: JLow@aqmd.gov; apolidori@aqmd.gov; reden@aqmd.gov
Cc: Hoag, Katherine; Flagg, Michael A; Plate, Mathew
Subject: Re: South Coast TSA
Attachments: SCAQMD TSA template.docx; Appendix H_Section3_lab ops.doc; data management-continuous_20110621.doc; data management-Pb_20110621.doc; data management-PM_20110621.doc; Field overview_20110616.doc; General-intro-QA_20110606.doc; Instrument Cert-Testing_20110615.docx; Instrument Repair_20110615.docx; network design_20110615.doc; site forms.doc; Standards and Calibration_20110615.docx

Hello,

As you know, Meredith is now the manager for the Air Quality Analysis Office. We are therefore working to distribute her former monitoring team staff responsibilities, one of which is the South Coast TSA. Kate Hoag and I are taking over the TSA, and Mat Plate will continue to be involved.

We wanted to check back in with you about a few things.

1. Mat Plate and I plan to come out September 24-25. If you could confirm that those dates still work for you, that'd be great. We cannot push the date much further back, as the TSA needs to be completed before the end of September.
2. Meredith sent a number of forms along with her May 29th email (see below). Because Kate and I catching up a bit, it would be helpful to get these forms back as early as possible. Please let us know if you might be able to get the forms to us by August 31st or earlier.
3. Please also send us a matrix of previous findings with the current status of corrective actions. Again, by August 31st would be great.
4. Finally, scheduling a short check-in call a few weeks before the TSA. Do any of the following times work for you:
 - a. Wednesday 9/4 at 11am, 2pm, or 3pm
 - b. Thursday 9/5, any hour between 9 and 4
 - c. Friday 9/6, any hour between 9 and 4

Thanks much! Please let me or Kate know if you have any questions. Looking forward to seeing you all.

-Gwen

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From: Kurpius, Meredith
Sent: Wednesday, May 29, 2013 1:30 PM
To: 'Jason Low'; apolidori@aqmd.gov; 'reden@aqmd.gov'
Cc: Plate, Mathew
Subject: South Coast TSA

Rudy, Jason, and Andrea,

It has been 3 years since our last Technical System Audit (TSA). As the regulation requires, it is time for another TSA. We will be doing a scaled-back in-person audit this time. Mat Plate and I intend to spend 2 days with you, hopefully in July. Please let me know if July 23-25 will work for an on-site visit. I will arrange a teleconference a few weeks prior to the on-site visit to review the schedule and address and questions.

I will be sending a detailed agenda for your review in the next few weeks. In the meantime, there are 3 sets of information that we will need roughly two weeks prior to the on-site visit:

- The section of the previous report that describes your ambient air monitoring program – please review and revise the section called, “Overview of Air Monitoring Program” to reflect current operations. I included the rest of the TSA report template in case you would like to see the structure of the entire report. [attachment: SCAQMD TSA template.docx]
- TSA Forms – please distribute and start filling them out. Note that much of the field operations information is already in the annual network plan. There is no need to copy the field operations information to the forms – you can simply reference the annual network plan. [all other attachments]
- Matrix of previous findings with current status of corrective actions.

Mat may also want some quality system documents but he will get in touch to request those if he needs them.

Let me know if you have any questions or thoughts. Thanks!

-Meredith

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**Technical System Audit
South Coast Air Quality Management District
Ambient Air Monitoring Program
(date of audit)**

Conducted by

**Air Quality Analysis Office
Air Division**

**Quality Assurance Office
Management and Technical
Services Division**

**US EPA Region 9
75 Hawthorne Street
San Francisco, California 94105**

Final Report: (date)

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GLOSSARY OF ACRONYMS

AQAO.....	Air Quality Analysis Office
AQIS.....	Air Quality Instrument Specialist
AQS.....	Air Quality System
BAM.....	Beta Attenuation Monitor
CA.....	California
CARB.....	California Air Resources Board
CO.....	Carbon Monoxide
CFR.....	Code of Federal Regulations
DQO.....	Data Quality Objective
EMS.....	Electronic Management System
EPA.....	Environmental Protection Agency
FEM.....	Federal Equivalent Method
FID	Flame Ionization Detector
FRM.....	Federal Reference Method
GC	Gas Chromatograph (Gas Chromatography)
ICP-MS.....	Inductively Coupled Plasma- Mass Spectroscopy
IO.....	Inorganic Compendium
LTE.....	less than or equal to
MATES	Multiple Air Toxics Exposure Study
MDL.....	Method Detection Limit
MS	Mass Spectrometer
MSD.....	Mass Selective Detector
NAAQS.....	National Ambient Air Quality Standard
NATTS.....	National Air Toxics Trends Stations
NCORE.....	National Core multipollutant monitoring stations
NIST.....	National Institute for Standards and Technology
NO _x /NO _y	Nitrogen Oxides
O ₃	Ozone
ORD	Office of Research and Development
PAMS.....	Photochemical Assessment Monitoring Stations
Pb.....	Lead
PE	Performance Evaluation
PM.....	Particulate Matter
PM _{2.5}	Particulate Matter with aerodynamic diameter LTE 2.5 µm
PM ₁₀	Particulate Matter with aerodynamic diameter LTE 10 µm
POC	Parameter Occurrence Code
PQAO.....	Primary Quality Assurance Organization
QA.....	Quality Assurance
QAPP.....	Quality Assurance Project Plan
QAO.....	Quality Assurance Office
QC.....	Quality Control
QMP.....	Quality Management Plan
RTI	Research Triangle Institute (EPA Contractor)

SCAQMD.....	South Coast Air Quality Management District
SLAMS.....	State or Local Air Monitoring Station
SOP.....	Standard Operating Procedure
SO ₂	Sulfur Dioxide
SPM.....	Special Purpose Monitor
SRP.....	Standard Reference Photometer
STN.....	Speciation Trends Network
STP.....	Standard Temperature and Pressure
TAD.....	Technical Assistance Document
TEOM.....	Tapered Element Oscillating Microbalance
TO.....	Toxic Organic Compendium
TSA.....	Technical System Audit
TSP.....	Total Suspended Particles
XRF.....	X-ray Fluorescence

EXECUTIVE SUMMARY

This document is a report on the findings of the United States Environmental Protection Agency (EPA) made during a Technical Systems Audit (TSA) of the South Coast Air Quality Management District (SCAQMD) ambient air monitoring program. A TSA is an on-site review and inspection of a state or local ambient air monitoring program to assess its compliance with established regulations governing the collection, analysis, validation, and reporting of ambient air quality data. This TSA meets the requirements for EPA audits of the SCAQMD monitoring organization required by 40 CFR part 58, appendix A, §2.5.

The TSA was conducted by EPA Region 9 staff from [dates of audit]. The audit team interviewed management and staff on specific aspects of the air monitoring program including network design, field operations, laboratory operations, data handling, quality assurance and quality control procedures. The audit team also inspected some of the monitoring sites operated by SCAQMD. The site inspections consisted of an interview with the site operator when possible, review of station and instrument logbooks, and evaluation of the station siting with respect to EPA requirements for probe siting (40 CFR 58, Appendix E). The laboratory inspection included a review of the particulate matter (PM) program for mass determinations of PM₁₀ and PM_{2.5}.

The TSA is one of the ways that EPA provides oversight to ensure that data collected by state, local, and tribal agencies meet required minimum data quality objectives. Other assessments, such as network reviews and performance evaluations, also provide information about the overall quality of ambient air monitoring data. These assessments enable agencies to identify and correct those program elements that may be adversely affecting the quality of ambient air data. The results of the TSA are summarized here and fully described in this report, along with recommended actions to address the findings. The specific actions to be taken by SCAQMD will be determined through negotiations between EPA and SCAQMD, and will be documented in a corrective action plan prepared by SCAQMD.

EPA would like to thank all the staff and management of SCAQMD for their assistance and cooperation during the audit.

A. Program Strengths:

B. Program Major Findings:

During the TSA, EPA identified areas where SCAQMD's monitoring program should be strengthened. The major findings are:

The individual findings are reported in the Findings section of this document and are also summarized in Appendix A.

TSA ACTIVITIES

From [date of audit], the U.S. EPA Region 9 Air Quality Analysis Office (AQAO) and the Region 9 Quality Assurance Office (QAO) conducted a Technical System Audit of SCAQMD's ambient air monitoring program. The TSA reviews one part of SCAQMD's program responsibility, the collection and analysis of ambient air quality data, which is the responsibility of the Air Quality Assessment Section. The TSA covered the following program areas:

- General / Quality Management
 - Program organization
 - Facilities
 - Independent quality assurance and quality control
 - Planning documents (including QMP, QAPPs, & SOPs)
 - General documentation policies
 - Training
 - Corrective action
 - Quality improvement
 - External performance audits
- Network Management / Field Operations
 - Network design
 - Changes to the network since the last audit
 - Proposed changes to the network
 - Field support
- Laboratory Operations
 - Routine operations
 - Quality control
 - Laboratory preventive maintenance
 - Laboratory record keeping
 - Laboratory data acquisition and handling
 - Specific pollutants: PM₁₀, PM_{2.5}, Toxics, PAMS, and Lead
- Data and Data Management
 - Data handling
 - Software documentation
 - Data validation and correction
 - Data processing
 - Internal reporting
 - External reporting

EPA tracked supporting documentation for data points from calendar years [redacted] and [redacted].

The EPA staff who conducted the TSA were [redacted] of the Region 9 Air Division's Air Quality Analysis Office and [redacted] of the Region 9 Quality Assurance Office conducted the TSA. In addition to the EPA Audit Team, [Matthew Lakin and Eugenia McNaughton], managers of the Air Quality Analysis Office and Quality Assurance Office, respectively, participated in the opening and closing meetings.

Participating managers and supervisors of the SCAQMD Air Quality Assessment Section included [REDACTED].

This report is divided into the following sections:

- Executive Summary – describes the purpose of the TSA and a summary of the major findings.
- TSA Activities – outlines the timing of this TSA and the programs that were covered.
- Overview of Air Monitoring Program – describes the District's Air Monitoring Program.
- Findings – collection of positive, major, and minor findings that includes details associated with each finding.
- Appendix A – summarized list of findings with priority ranking.
- Appendix B – District organizational chart.

The Findings section includes positive findings along with findings that require corrective action. The findings are grouped by program area. Recommendations to resolve findings are provided for each finding that requires corrective action to give some indication of the EPA expectations as to how findings can be addressed. If the District has other approaches or alternatives to address the concerns identified, EPA will consider them, provided the corrective action adequately addresses the finding. Appendix A is a summarized list of findings and each finding, excluding positive findings, is grouped according to priority, as either highest priority, moderate priority, or all other significant findings. Higher priority findings are those that: (1) are over-arching issues, (2) have a greater impact on regulatory decisions, and/or (3) have a greater effect on data quality. Regardless of priority, all findings, excluding positive findings, need to be addressed in a corrective action report.

General

The audit team interviewed management and staff on specific aspects of the air monitoring program including network design, field operations, laboratory operations, data handling, quality assurance and quality control procedures. EPA interviewed [REDACTED] and reviewed SCAQMD's [REDACTED].

Network Management

EPA interviewed [REDACTED] and reviewed SCAQMD's [REDACTED] Annual Network plan. SCAQMD also submitted a five-year Annual Network Assessment as required by 40 CFR part 58.10. Generally, the monitoring network [meets/does not meet] the requirements for the minimum number of monitoring sites designated as SLAMS for all of the criteria pollutants.

Field Operations

In addition to [REDACTED], EPA interviewed several Air Quality Monitoring Unit staff. All staff demonstrated a thorough knowledge of the monitoring equipment for which they were responsible.

EPA visited ([number of sites visited]) monitoring sites ([site names]). All sites met the siting criteria of 40 CFR part 58, appendix E. The evaluation included inspection of the inlet manifolds, examination of station and instrument logbooks, and a check of whether appropriate QC checks and QA audits were being performed. [general comments about the sites]

Laboratory Operations

Particulate Matter Laboratory (Gravimetrics Laboratory)

EPA visited the particulate matter (gravimetric) laboratory and interviewed [redacted]. [comments about the lab]

Toxicology Laboratory

EPA visited the toxicology laboratory and interviewed [redacted]. [comments about the lab]

Data and Data Management

This section covers data management for criteria pollutants (O₃, CO, NO₂, SO₂, PM_{2.5}, and PM₁₀). Staff interviewed were [names of staff].

Quality Management

EPA interviewed [names] and reviewed quality management documents. In addition, EPA collected information about QA/QC activities during interviews of other sections of the technical system.

OVERVIEW OF AIR MONITORING PROGRAM

General Program

Federal and State of California laws require that clean air standards be met and maintained throughout the country and the State of California. Authority and responsibility for air quality monitoring has been delegated to SCAQMD by EPA pursuant to the Clean Air Act of 1977 and the Clean Air Act Amendments of 1990. The SCAQMD is defined in the California Health and Safety Code, Division 26, Air Resources, Section 40412 as the “Sole and exclusive agent having responsibility for air pollution control within the District.” The State defines the geographic extent of SCAQMD as “portions of Counties of Los Angeles, Orange, Riverside, and San Bernardino included within the area of the South Coast Air Basin, as described in Section 60104 of the Title 17 of the California Administrative Code.”

SCAQMD currently has 34 active monitoring stations for criteria pollutants. The pollutants measured include:

- Carbon Monoxide
- Nitrogen Dioxide
- Sulfur Dioxide
- Lead
- Ozone
- Particulate Matter (PM₁₀ and PM_{2.5})

The Executive Officer of SCAQMD is, Barry Wallerstein. Chung Liu, Deputy Executive Officer, heads the Science & Technology Advancement Division. The Monitoring & Analysis sub-Division is the primary organization in Science & Technology Advancement responsible for air monitoring. The Monitoring and Analysis group has three functional areas: Laboratory Services & Source Test Engineering (Rudy Eden, manager), Atmospheric Measurements (Philip Fine, manager), and Quality Assurance (Jason Low, manager).

Atmospheric Measurements (Monitoring), Laboratory Services & Source Test Engineering (Laboratory), and Quality Assurance (QA) each have a role in the collection and evaluation of ambient air data as defined by the SCAQMD Quality Management Plan (QMP). The Monitoring group is responsible for most of the ambient air data collection, including sampling and data processing of continuous air monitors. The Laboratory is responsible for preparation of sampling media, analysis of analytical samples from the non-continuous monitors, and processing of data for these samples analyzed by the laboratory. Both groups are responsible for implementing routine quality assurance and quality control (QA/QC) procedures. The QA group is responsible for tracking and oversight of training, corrective actions, and data handling. The QA group also implements performance and technical audits and coordinates and participates in the preparation of QA planning documents.

Network Management

The ambient air monitoring network in the South Coast AQMD currently consists of 34 State/Local Air Monitoring Stations (SLAMS) plus several source oriented lead monitors, special studies and Special Purpose Monitoring (SPM) sites that utilize a variety of air pollutant measuring instruments. The following table summarizes the SLAMS sites in the SCAQMD.

Table 1: SLAMS sites in the SCAQMD

Site	O ₃	CO	NO _x	SO ₂	FRM PM ₁₀	BAM PM ₁₀	TEOM PM ₁₀	FRM PM _{2.5}	BAM PM _{2.5}	Pb
Anaheim	X	X	X		X		X	X	X	
Azusa	X	X	X		X			X		
Banning Airport	X		X		X					
Big Bear								X		
Burbank	X	X	X	X	X		X	X	X	
Compton (Replaced Lynwood)	X	X	X					X		X
Costa Mesa	X	X	X	X						
Crestline	X	X			X					
Fontana	X	X	X	X	X			X		
Glendora	X	X	X				X			
Indio	X				X	X		X, X		
La Habra	X	X	X							
LA-Main St	X	X	X	X	X	X		X, X		X
Lake Elsinor	X	X	X				X			
LAX Hastings	X	X	X	X	X					X
Long Beach - North	X	X	X	X	X		X	X	X	X
Mira Loma - Van Buren (replacing Jurupa)	X	X	X		X			X	X	
Mission Viejo	X	X			X			X		
Norco					X					
Ontario Fire Station					X			X		
Palm Springs	X	X	X		X	X		X		
Pasadena	X	X	X					X		
Perris	X				X					
Pico Rivera #2	X	X	X					X		X
Pomona	X	X	X							
Redlands	X				X					
Reseda	X	X	X					X		
Riverside		X	X					X		X
Rubidoux	X	X	X	X	X		X	X, X	X	X
San Bernadino	X	X	X		X		X	X		X
Santa Clarita	X	X	X		X					
South Long Beach					X			X		X
Upland	X	X	X				X			X
West LA	X	X	X							

Source: SCAQMD 2009 Air Monitoring Network Plan

SCAQMD also operates the following special purpose monitoring sites (SPM) and source-oriented lead sites:

- Port study sites at the Ports of Los Angeles and Long Beach
- Pb at Exide: Rehrig in Vernon, and ATSF in City of Commerce
- Pb at Quemetco (Closet World) in City of Industry
- Pb at Trojan Battery (Uddelholm) in Santa Fe Springs
- Pb at Van Nuys Airport

In addition, the District operates a network of air toxics stations, including a National Air Toxics Trends Stations (NATTS) at the Los Angeles (Main) and Rubidoux sites. This audit addressed air toxics activities that support the NATTS, including both field and laboratory operations. These two sites are also designated as National Core (NCore) multipollutant monitoring sites.

The District operates a network of Photochemical Assessment Monitoring Stations (PAMS). The PAMS network consists of seven sites. LAX/Hastings is a Type 1 (upwind, background, and transport) PAMS site; Azusa, Burbank, Los Angeles (Main), and Pico Rivera are Type 2 (maximum precursor emission/central business district) sites; Rubidoux and Santa Clarita are Type 3 (maximum ozone concentration) sites. EPA has approved the District's PAMS network, operating schedule and forecasting scheme.

Field Operations

Field operations are performed by the Atmospheric Measurements Division, which is managed by Philip Fine. This division is divided into two groups: Ambient Monitoring and Special Monitoring. Routine ambient monitoring is conducted by the Ambient Monitoring Group. The Special Monitoring Group undertakes special projects and seasonal monitoring as needed. The Ambient Monitoring group is subdivided into Operations, Support, and Data Management sections. Day-to-day monitoring station operations are performed by the Operations section, which is broken into sub-sections. Each sub-section has at least one Senior Air Quality Instrument Specialist (AQIS) and five AQISs. Repairs and calibrations are performed by the AQISs in the Support section.

Laboratory Operations

Analytical laboratories provide support for measurement methods that are either too complex or too sensitive to perform in the field environment. In order to provide these services, laboratories employ advanced instrumentation and staff with highly specialized training.

For ambient air samples to provide useful information or evidence, laboratory analyses must meet the following basic requirements:

1. The laboratory must maintain a suitable facility for sample receipt, storage, analysis, and reduction and storage of data.
2. The laboratory must have sufficient and appropriate equipment that must be calibrated and maintained frequently.
3. The laboratory must have an adequate number of qualified staff.

4. Analytical procedures must be in accordance with official guidance, EPA methods and accepted practice.
5. Complete and accurate records must be kept.

SCAQMD has a clean, modern, expansive laboratory facility located at the headquarters office in Diamond Bar, California. The laboratory supports many chemical analyses necessary to understand a large complex air basin and its diverse source mix. One of the primary responsibilities of the laboratory is the handling of PM filters, which includes preparation, weighing, tracking and storing PM_{2.5}, PM₁₀ and total suspended particle (TSP) filters. In addition to PM responsibilities, the laboratory is also responsible for sample analyses of Speciation Trends Network (STN), PAMS, NATTS and special projects run by SCAQMD, such as the Multiple Air Toxics Exposure Study (MATES) series. The compounds SCAQMD routinely analyzes for include:

- VOCs for PAMS (TO-14)
- VOCs for NATTS (TO-15)
- Carbonyls for PAMS and NATTS (Toxic Organic Compendium [TO]-11A)
- PM_{2.5} metals for STN by X-ray Fluorescence (XRF) (Inorganic Compendium [IO]-3.3)
- PM₁₀ metals for NATTS by Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS) (IO-3.5)
- Pb-TSP by XRF
- Acrolein for NATTS (modified TO-15)
- Hexavalent chrome for NATTS by ion chromatography (modified California Air Resources Board (CARB) method)
- Anions for STN

There are a number of additional activities the laboratory undertakes to support the collection and analysis of air pollutants. These include canister cleaning and preparation, data validation and sample storage.

Particulate Matter Laboratory (Gravimetric Laboratory)

[Describe PM lab here.]

Toxicology Laboratory

[Describe toxics lab here.]

Data and Data Management

Data management includes data collection, the data validation process, and a data management system. Data management at the District follows two separate tracks: one for continuous (i.e., non-laboratory) data and one for laboratory data.

SCAQMD has defined procedures for handling data from the time of acquisition to the time that it is submitted to EPA. The procedures are well known to the principal data providers and reviewers. Responsibility for managing ambient monitoring data is divided between the

Atmospheric Measurements Branch operators, data validators, and Senior and Principal Air Quality Instrument Specialists (AQIS).

The Quality Assurance Manager reports results of QA audits and evaluations to a Quality Assurance Alert Log, AQS Event Flag Summary, and Corrective Action Request Log. These reports are incorporated into the review processes of Atmospheric Measurements and the Laboratory.

SCAQMD has four separate data management and validation processes in place for different data streams reported to AQS. Continuous monitoring data is handled by Atmospheric Measurements. The laboratory has three separate data streams: 1) filter-based PM_{2.5}; 2) filter-based PM₁₀, TSP, Pb, and non-NAAQS metals; and 3) organic analyses.

Continuous Monitoring for Gaseous Pollutants and Particulates

Air quality data measured by the continuous analyzers at the field stations are stored in SCAQMD data loggers and station computers. Each station is polled minute-by-minute and the data are transmitted directly to the District's central computer. Electronic chart recorders (Eurotherm Chessels) located at each station serve as a back-up system and provide a supplemental record for the data validation. Data may also be transferred manually using various devices, including laptop computers and flash drives.

SCAQMD performs four levels of validation for continuous data. The station data loggers and the FORTRAN-based data system perform automated checks. Field Operation staff review data and recommend flags. Data validators review quality control parameters. Data validators then evaluate data in relation to concurrent, corresponding data sets.

Laboratory Data Systems: Filter-Based PM_{2.5} Particulate Monitoring; Monitoring of Lead and non-NAAQS Metals; and Monitoring of Organic Compounds

PM_{2.5} filters are prepared and pre-weighed by the filter laboratory and transferred to the field technicians. The laboratory also prepares other sampling media (canisters, filters, and sorbents) to be collected by the field technicians, with the exception of PAMS auto GCs, which are operated in the field by the laboratory staff. The field group performs a review of the field handling, sampler performance, and other field collection information. When filters are processed at the laboratory, the filter laboratory staff performs a review of the field operational parameters, including electronic records produced by the samplers. The laboratory reviews the Quality Assurance Alert Log, AQS Event Flag Summary, and Corrective Action request log for items specific to the data being processed. Data is appropriately flagged or invalidated and a Senior Laboratory Chemist performs the final levels of data review prior to uploading data to AQS.

Quality Management

Quality management is the system put in place to oversee quality assurance, quality control and quality improvement activities. EPA requires that ambient air monitoring agencies have a quality

management system that conforms to 40 CFR part 50 Appendix A and EPA's quality policy (EPA Order CIO 2105.0). Additionally, EPA grant regulations specifically require each grantee to provide for QA activities (40 CFR part 31.45). Specifically, 40 CFR part 50 Appendix A, §3 requires that each ambient air monitoring Primary Quality Assurance Organization (PQAO) conform to certain quality management practices. These include:

- A documented quality system in place that meets EPA requirements for QMPs and QAPPs.
- A quality management function that is independent of air monitoring operations.
- Defined Data Quality Objectives (DQOs), or equivalent systematic planning procedures, for all monitoring programs.
- Participation in National Performance Evaluation Programs, which consist of performance audits used to independently determine program adequacy, national monitoring network performance, and national consistency.
- Participation in Technical Systems Audits by EPA at a frequency of at least once every three years.
- Use of certified reference materials to standardize monitoring equipment.

EPA views the application of these quality management system components as integral to monitoring programs. Insufficient quality management and control may undermine the ability of EPA to make NAAQS designation decisions.

SCAQMD has a defined quality management system, which includes a quality management plan and oversight by an independent quality assurance manager and audit program.

SCAQMD has a QA group led by a QA Manager, Jason Low, having organizational parity with the Ambient Monitoring and Laboratory Managers. There are two direct reports to the QA Manager, a QA auditor and a QA Chemist. The QA group also manages a support contract that performs additional QA/QC audits of the monitoring network.

EPA regulations require independent performance audits of gaseous pollutants and flow audits of PM_{2.5}, and PM₁₀ and monitors. For gaseous pollutants, the current regulation requires that 25% of each pollutant monitoring network be audited per calendar quarter so that each instrument is audited once per year. Prior to 2007, flow audits of these monitors were also required. Additionally, quarterly independent flow audits of PM_{2.5} samplers were required. Beginning in calendar year 2007, semi-annual flow audits of each PM_{2.5}, PM₁₀, and TSP sampler are required (40 CFR, Part 58, Appendix A, Sections 3.2.4 and 3.3.3.) This is in addition to the required monthly flow evaluations (40 CFR, Part 58, Appendix A, Sections 3.2.3 and 3.3.2.).

The Quality Assurance group is responsible for conducting the required gaseous pollutant audits and PM₁₀ and PM_{2.5} flow audits. An independent contractor supports the flow audits of filter-based samplers and provides audit results to site operators. A contractor also supports meteorological audits.

FINDINGS

Program Area	Finding Numbers	EPA Contact
General		
Network Management		
Field Operations		
Laboratory Operations Gravimetric Laboratory		
Laboratory Operations Toxicology Laboratory		
Data and Data Management		
Quality Management		

Finding #	1
Agency:	SCAQMD
Date of Audit:	
Program Area:	
Finding:	
Discussion:	
References:	
Recommendation to Address Finding:	

APPENDIX A: SUMMARY OF FINDINGS

FINDINGS

Finding 1:

APPENDIX B: ORGANIZATIONAL CHARTS

3) LABORATORY OPERATIONS

State/Local/Tribal Agency Audited:

City, State, and Zip Code:

Date of Technical System Audit:

Auditor / Agency:

Key Individuals

Laboratory Manager:

Laboratory Supervisor:

Quality Assurance Manager:

Laboratory Staff involved in the TSA:

a) Routine Operations

What analytical methods are employed in support of your air monitoring network?

Analysis	Name or Description of Method
PM ₁₀	
PM _{2.5}	
Pb	
Others (list by pollutant)	

Please describe areas where there have been difficulties meeting the regulatory requirements for any of the above analytical methods.

In the table below, please identify the current versions of written methods, supplements, and guidelines that are used in your agency.

Analysis	Documentation of Method
PM ₁₀	
PM _{2.5}	
Pb	
Others (list by pollutant)	

Question	Yes	No	Comment
Were procedures for the methods listed above included in the agency's QA Project Plan or SOP's and were reviewed by EPA? Also, are SOP's easily/readily accessible for use and reference?			
Does your lab have sufficient instrumentation to conduct analyses?			

d) Please describe needs for laboratory instrumentation.

b) Laboratory Quality Control

Please identify laboratory standards used in support of the air monitoring program, including standards which may be kept in an analytical laboratory and standards which may be kept in a field support area or quality assurance laboratory that is dedicated to the air monitoring program (attach additional sheets if appropriate):

Parameter	Location of Standards	Laboratory Standard	Recertification Date	Primary Standard*
CO				
NO ₂				
SO ₂				
O ₃				
Weights				
Temperature				
Moisture				
Barometric Pressure				
Flow				
Other Flow Standard				
Lead				
Other				

*Standards to which the laboratory standards can be traced.

Question	Yes	No	Comment
Are all chemicals and solutions clearly marked with an indication of shelf life?			
Are chemicals removed and properly disposed of when shelf life expires?			
Are only ACS grade chemicals used by the laboratory?			
e) Comment on the traceability of chemicals used in the preparation of calibration standards			

Question	Yes	No	Comment
Does the laboratory purchase standard solutions such as those for use with lead or other metals analysis?			
Are all calibration procedures documented?			
If answer "yes" to (f), please describe the following: (1) Title of the document: (2) Revision number: (3) Where the document is:			
Are at least one duplicate, one blank, and one standard or spike included with a given analytical batch?			
Briefly describe the laboratory's use of data derived from blank analyses.			
Are criteria established to determine whether a blank data are acceptable?			
How frequently and at what concentration ranges does the lab perform duplicate analysis? What constitutes an acceptable agreement? Please comment in the space below.			
Please describe how the lab use data obtained from spiked samples, including the acceptance criteria (e.g., acceptable percent recovery).			
Question	Yes	No	Comment
Does the laboratory routinely include samples of reference material within an analytical batch?			
If yes, indicate frequency, level, and material used.			
Are mid-range standards included in analytical batches?			
Please describe the frequency, level and compound used in the space provided below.			

Question	Yes	No	Comment
Are criteria for real time quality control established that are based on the results obtained for the mid-range standards discussed above?			
If yes, briefly discuss them below or indicate the document in which they can be found.			
Are appropriate acceptance criteria for each type of analysis documented ?			

c) Laboratory Preventive Maintenance

Question	Yes	No	Comment
For laboratory equipment, who has the responsibility for performing preventive maintenance?			
Is most maintenance performed in the lab?			
Is a maintenance log maintained for each major laboratory instrument?			
Are service contracts in place for major analytical instruments?			

d) Laboratory Record Keeping

Question	Yes	No	Comment
Are all samples that are received by the laboratory logged in?			
Discuss sample routing and special needs for analysis (or attach a copy of the latest SOP which covers this). Attach a flow chart if possible.			
Are log books kept for all analytical laboratory instruments?			
Are there log books or other records that indicate the checks made on materials and instruments such as weights, humidity indicators, balances, and thermometers?			
Identify type of record, acceptable/non-acceptable			
Are log books maintained to track the preparation of filters for the field?			
Are they current?			
Do they indicate proper use of conditioning?			
Weighings?			
Stamping and numbering?			
Are log books kept which track filters returning from the field for analysis?			
How are data records from the laboratory archived?			
Where?			
Who has the responsibility? Person			
Title			
How long are records kept? Years			
Does a chain-of-custody procedure exist for laboratory samples?			
If yes, indicate date, title and revision number where it can be found			

e) Laboratory Data Acquisition and Handling

Question	Yes	No	Comment
Identify those laboratory instruments which make use of computer interfaces directly to record data. Which ones use strip charts? Integrators?			
Are QC data readily available to the analyst during a given analytical run?			
What is the laboratory's capability with regard to data recovery? In case of problems, can they recapture data or are they dependent on computer operations? Discuss briefly.			
Has a user's manual been prepared for the automated data acquisition instrumentation?			
Please provide below a data flow diagram which establishes, by a short summary flow chart: transcriptions, validations, and reporting format changes the data goes through before being released by the laboratory.			

f) Specific Pollutants: PM₁₀, PM_{2.5} and Lead

Question	Yes	No	Comment
<u>PM₁₀ and PM_{2.5}</u>			
Does the agency use filters supplied by EPA?			
Do filters meet the specifications in 40 CFR 50?			
Are filters visually inspected via strong light from a view box for pinholes and other imperfections?			
Where does the laboratory keep records of the serial numbers of filters?			
Are unexposed filters equilibrated in controlled conditioning environment which meets or exceeds the requirements of 40 CFR 50?			
Are the temperature and relative humidity of the conditioning environment monitored?			
Are the temperature and humidity monitors calibrated?			
Are balances checked with Class S or Class M weights each day when they are used?			
Is the balance check information placed in QC log book?			
To what sensitivity are filter weights recorded?			
Are filter serial numbers and tare weights recorded in a bound notebook?			
Are filters packaged for protection while transporting to and from the monitoring stations?			
How often are filter samples collected? (Indicate the average elapsed time in hours between end of sampling and laboratory receipt.)			
In what medium are field measurements recorded (e.g., in a log book, on a filter folder, or on standard forms)?			
Are exposed filters reconditioned for at least 24 hrs in the same conditioning environment as for unexposed filters?			
Briefly describe how exposed filters are prepared for conditioning.			
Briefly describe how exposed filters are stored after being weighed.			

Question	Yes	No	Comment
Are blank filters reweighed?			
Are chemical analyses performed on filters?			
<u>LEAD</u>			
Is analysis for lead being conducted using atomic absorption spectrometry with air acetylene flame?			If not, has the agency received an equivalency designation of their procedure?
Is either the hot acid or ultrasonic extraction procedure being followed precisely? Is Class A borosilicate glassware used throughout the analysis?			Which?
Is all glassware cleaned with detergent, soaked and rinsed three times with distilled or deionized water?			
If extracted samples are stored, are linear polyethylene bottles used?			
Are all batches of glass fiber filters tested for background lead content?			
At a rate of 20 to 30 random filters per batch of 500 or greater?			Indicate rate.
Are ACS reagent grade HNO ₃ and HCl used in the analysis?			
Is a calibration curve available having concentrations that cover the linear absorption range of the atomic absorption instrumentation?			
Is the stability of the calibration curve checked by alternately remeasuring every 10th sample a concentration # 10g Pb/ml; # 100g Pb/ml?			

DATA AND DATA MANAGEMENT For Continuous Analyzers

State/Local/Tribal Agency Audited:

Auditor / Agency:

Key Individuals

Data Manager:

Data Supervisor:

Data Validator(s):

Quality Assurance Manager:

Overview of Data Flow

Question	Yes	No	Comment
Is there a procedure, description, or a chart which shows a complete data sequence from point of acquisition to point of submission of data to EPA? If yes, please attach. If no, please include one in the space below.			
Data flow diagram:			
Are procedures for data handling (e.g., data transfer, storage, etc.) documented? If yes, list documentation in comments.			If yes, indicate document where such criteria can be found (title, revision date).

Raw Data

Question	Yes	No	Comment
What is the data processing location for data received from the field? Office/Lab: Computer/server:			
In what media (e.g., diskette, data cartridge, or telemetry) and formats do data arrive at the data processing location? Please list below.			
Category of Data (by Pollutant)	Data Media and Formats		
How often are data received at the data processing location from the field sites?			
How are data entered to the computer/server at the data processing location (e.g., computerized transcription (copy from disk or data transfer device), manual entry, digitization of strip charts, or other)?			

Question	Yes	No	Comment
For manual data, is a double-key entry system used?			
Once uploaded to the data processing center: What database(s) is/are data uploaded into for storage? What is the format of data in the database? What database(s) is/are used to view and/or edit data?			
What dataset is considered the raw dataset, representing data from the field before it is edited? How are these data protected? Who has access to the raw data? How is access by others prevented?			
How is the raw dataset backed up? How often is the raw dataset backed up?			
Are raw data submitted to other databases such as AirNow or state databases? If yes, list in comments.			

Data Validation

Question	Yes	No	Comment
Has your agency established and documented the validation criteria?			If yes, indicate document where such criteria can be found (title, revision date).
Does documentation exist on the identification and applicability of flags (i.e., identification of suspect values) within the data as recorded with the data in the computer files? If yes, who are these flagging documents available to? (please check all that apply) <input type="checkbox"/> Field operators <input type="checkbox"/> Data validator(s) <input type="checkbox"/> Data supervisor <input type="checkbox"/> Data manager			
Does your agency document the data validation criteria including limits for values such as flow rates, calibration results, or range tests for ambient measurements? If yes, who are these validation criteria documents available to? (please check all that apply) <input type="checkbox"/> Field operators <input type="checkbox"/> Data validator(s)			

Question	Yes	No	Comment
<input type="checkbox"/> Data supervisor <input type="checkbox"/> Data manager			
Review by Field Operators: Do field operators review any data?			If yes, indicate which data.
How are data issues from the field operators communicated to the data validator(s)? When is this done? What information is included?			
First Level Data Validation (i.e., done by validator(s) at data processing location): When does the first level of data validation occur (e.g., daily, weekly, monthly)? By whom? Describe the process of this data review: What action is taken by the data validator if he/she finds data that does not meet data validation criteria (e.g., data flagged, modified, deleted, etc.)?			
Second Level Data Validation: When does the second level of data validation occur (e.g., daily, weekly, monthly)? By whom? Describe the process of this data review: What action is taken by the reviewer if he/she finds data that does not meet data validation criteria (e.g., data flagged, modified, deleted, etc.)?			
Third Level Data Validation: Does a third level of data validation occur? If so, when? By whom? Describe the process of this data review: What action is taken by the reviewer if he/she finds data that does not meet data validation criteria (e.g., data flagged, modified, deleted, etc.)?			
Additional Data Review: Describe any additional data review that occurs.			

Question	Yes	No	Comment
What criteria are used to determine that a data point be deleted? Discuss briefly.			
What criteria are used to determine if data need to be reprocessed? Discuss.			

Data Correction and Submittal

Question	Yes	No	Comment
At what stage(s) in the data review process are changes to the database implemented? By whom? Where is the basis for the data changes recorded? Who has final approval authority for changes? Is the raw dataset overwritten or is a new dataset generated? If the raw dataset is overwritten, describe where the original dataset is archived.			
Are data submitted to AirNow?			
If yes, when are data submitted to AirNow?			
When are data routinely submitted to AQS?			
Please describe how changes made to data that were submitted to AQS and AirNow are documented.			
Who has signature authority for approving corrections to AQS and AirNow?			
Are <u>corrected</u> data resubmitted to the issuing group for cross-checking prior to release?			
Does your agency have information on the reporting of precision and accuracy data available?			
Are data precision and accuracy checked each time they are			

Question	Yes	No	Comment
calculated, recorded, or transcribed to ensure that incorrect values are not submitted to EPA?			
Data Certification: Are data certified?			
<p>Who prepares the data certification package?</p> <p>Who reviews the data certification package?</p> <p>Who signs the data certification package?</p> <p>What data are included (e.g., SLAMS, SPM, Toxics, etc.)?</p>			

Data Backup

Question	Yes	No	Comment
List points at which data are backed up and method of backup:			
What is the recovery capability in the event of a significant computer problem (i.e., how much time and data would be lost)?			
Has any significant loss of data occurred within the past three years due to data management issues? If yes, please describe in comments.			

Software

Question	Yes	No	Comment
Does your agency use an AQS Manual?			If yes, list the title, version number, and date published.
Does your agency use an AirNow Manual?			If yes, list the title, version number, and date published.
<p>What are the origins of the software used to prepare air monitoring data for release into the AQS and AirNow database? Please list the documentation for the software currently in use for data processing, including the names of the software packages, vendor or author, revision numbers, and the revision dates of the software.</p>			

Question	Yes	No	Comment
Has your agency tested the data processing software to ensure its performance of the intended function are consistent with the QA Handbook, Volume II, and Section 14.0?			
Does your agency document software tests?			
If yes, provide the documentation			

Record-keeping and Data Audits

Question	Yes	No	Comment
Are records kept for at least 3 years by the agency in an orderly, accessible form?			
If yes, does this include: <input type="checkbox"/> raw data, <input type="checkbox"/> calculation, <input type="checkbox"/> QC data, and <input type="checkbox"/> reports? If no, please comment:			
Are audits on data reduction procedure performed on a routine basis?			
If yes, at what frequency?			

Data Reports

Question	Yes	No	Comment
Does the agency generate data summary reports?			
If yes, please list up to three reports routinely generated, including the information requested below.			
Report Title	Distribution		Period Covered
Does your agency generate internal reports as a result of the <i>audits</i> required under 40 CFR 58, Appendix A?			
If yes, please list up to three reports routinely generated, including the information requested below.			
Report Title	Frequency		
Does your agency generate internal reports as a result of the <i>precision checks</i> required under 40 CFR 58, Appendix A?			
If yes, please list up to three reports routinely generated, including the information requested below.			
Report Title	Frequency		
Do either the audit or precision check reports indicated include a discussion of corrective actions initiated based on audit or			

Question	Yes	No	Comment
precision check results?			

Data Reporting

For the current calendar year or portion thereof which ended at least 90 calendar days prior to the receipt of this questionnaire, please provide the following percentages for required data submitted on time.

Period covered: _____

Percent Submitted on Time*							
Monitoring Qtr.	SO ₂	CO	O ₃	NO ₂	PM ₁₀	PM _{2.5}	Pb
1 (Jan 1 - March 31)							
2 (Apr 1 - June 30)							
3 (July 1 - Sept. 30)							
4 (Oct.1 - Dec. 31)							

*"On time" = within 90 calendar days after the end of the quarter in which the data were collected.

For the same period, what fraction of the stations (by pollutant) reported less than 75% of the data (adjusted for seasonal monitoring and site start-ups and terminations)?

Period covered: _____

Percent of Stations <u><75% Data Recovery</u>							
Monitoring Qtr.	SO ₂	CO	O ₃	NO ₂	PM ₁₀	PM _{2.5}	Pb
1 (Jan 1 - March 31)							
2 (Apr 1 - June 30)							
3 (July 1 - Sept. 30)							
4 (Oct.1 - Dec. 31)							

DATA AND DATA MANAGEMENT For Pb Data

State/Local/Tribal Agency Audited:

Auditor / Agency:

Key Individuals

Pb Lab Chemist:

Data Manager:

Data Supervisor:

Data Validator(s):

Quality Assurance Manager:

Overview of Data Flow

Question	Yes	No	Comment
Is there a procedure, description, or a chart which shows a complete data sequence from point of acquisition to point of submission of data to EPA? If yes, please attach. If no, please include one in the space below.			
Data flow diagram:			
Are procedures for data handling (e.g., data transfer, storage, etc.) documented? If yes, list documentation in comments.			If yes, indicate document where such criteria can be found (title, revision date).

Raw Data

Question	Yes	No	Comment
What is the data processing location for data received from the Pb analyses? Office/Lab: Computer/server:			
In what media (e.g., diskette, data cartridge, or telemetry) and formats do data arrive at the data processing location? Please list below.			
How often are data received at the data processing location from the Pb analyses?			
How are data entered to the computer/server at the data processing location (e.g., computerized transcription (copy from disk or data transfer device), manual entry, digitization of strip charts, or other)?			
For manual data, is a double-key entry system used?			
Once uploaded to the data processing center:			
What database(s) is/are data uploaded into for storage?			
What is the format of data in the database?			
What database(s) is/are used to view and/or edit data?			

Question	Yes	No	Comment
What dataset is considered the raw dataset, representing data from the analyses before being edited?			
How are these data protected?			
Who has access to the raw data?			
How is access by others prevented?			
How is the raw dataset backed up?			
How often is the raw dataset backed up?			
Are raw data submitted to other databases such as state databases? If yes, list in comments.			

Data Validation

Question	Yes	No	Comment
Has your agency established and documented the validation criteria?			If yes, indicate document where such criteria can be found (title, revision date).
Does documentation exist on the identification and applicability of flags (i.e., identification of suspect values) within the data as recorded with the data in the computer files?			
If yes, who are these flagging documents available to? (please check all that apply) <input type="checkbox"/> Field operators <input type="checkbox"/> Pb lab chemist <input type="checkbox"/> Data validator(s) <input type="checkbox"/> Data supervisor <input type="checkbox"/> Data manager			
Does your agency document the data validation criteria including limits for values such as flow rates, calibration results, or range tests for ambient measurements?			
If yes, who are these validation criteria documents available to? (please check all that apply) <input type="checkbox"/> Field operators <input type="checkbox"/> Pb lab chemist <input type="checkbox"/> Data validator(s) <input type="checkbox"/> Data supervisor <input type="checkbox"/> Data manager			
Review by Field Operators: Do field operators review any data?			If yes, indicate which data.
How are data issues from the field operators communicated to the data validator(s)?			

Question	Yes	No	Comment
<p>When is this done?</p> <p>What information is included?</p>			
<p>Review by Lab Chemist:</p> <p>Does lab chemist review any data?</p>			If yes, indicate which data.
<p>How are data issues from the lab chemist communicated to the data validator(s)?</p> <p>When is this done?</p> <p>What information is included?</p>			
<p>First Level Data Validation (i.e., done by validator(s) at data processing location):</p> <p>When does the first level of data validation occur (e.g., daily, weekly, monthly)?</p> <p>By whom?</p> <p>Describe the process of this data review:</p> <p>What action is taken by the data validator if he/she finds data that does not meet data validation criteria (e.g., data flagged, modified, deleted, etc.)?</p>			
<p>Second Level Data Validation:</p> <p>When does the second level of data validation occur (e.g., daily, weekly, monthly)?</p> <p>By whom?</p> <p>Describe the process of this data review:</p> <p>What action is taken by the reviewer if he/she finds data that does not meet data validation criteria (e.g., data flagged, modified, deleted, etc.)?</p>			
<p>Third Level Data Validation:</p> <p>Does a third level of data validation occur?</p> <p>If so, when?</p> <p>By whom?</p> <p>Describe the process of this data review:</p> <p>What action is taken by the reviewer if he/she finds data that does not meet data validation criteria (e.g., data flagged, modified, deleted, etc.)?</p>			
<p>Additional Data Review:</p>			

Question	Yes	No	Comment
Describe any additional data review that occurs.			
What criteria are used to determine that a data point be deleted? Discuss briefly.			
What criteria are used to determine if data need to be reprocessed? Discuss.			

Data Correction and Submittal

Question	Yes	No	Comment
At what stage(s) in the data review process are changes to the database implemented? By whom? Where is the basis for the data changes recorded? Who has final approval authority for changes? Is the raw dataset overwritten or is a new dataset generated? If the raw dataset is overwritten, describe where the original dataset is archived.			
When are data routinely submitted to AQS?			
Please describe how changes made to data that were submitted to AQS are documented.			
Who has signature authority for approving corrections to AQS?			
Are <u>corrected</u> data resubmitted to the issuing group for cross-checking prior to release?			
Does your agency have information on the reporting of precision and accuracy data available?			
Are data precision and accuracy checked each time they are calculated, recorded, or transcribed to ensure that incorrect values are not submitted to EPA?			

Question	Yes	No	Comment
Data Certification: Are data certified?			
Who prepares the data certification package?			
Who reviews the data certification package?			
Who signs the data certification package?			
What data are included (e.g., SLAMS, SPM, etc.)?			

Data Backup

Question	Yes	No	Comment
List points at which data are backed up and method of backup:			
What is the recovery capability in the event of a significant computer problem (i.e., how much time and data would be lost)?			
Has any significant loss of data occurred within the past three years due to data management issues? If yes, please describe in comments.			

Software

Question	Yes	No	Comment
Does your agency use an AQS Manual?			If yes, list the title, version number, and date published.
What are the origins of the software used to prepare air monitoring data for release into the AQS database? Please list the documentation for the software currently in use for data processing, including the names of the software packages, vendor or author, revision numbers, and the revision dates of the software.			
Has your agency tested the data processing software to ensure its performance of the intended function are consistent with			

Question	Yes	No	Comment
the QA Handbook, Volume II, and Section 14.0?			
Does your agency document software tests?			
If yes, provide the documentation			

Record-keeping and Data Audits

Question	Yes	No	Comment
Are records kept for at least 3 years by the agency in an orderly, accessible form?			
If yes, does this include: <input type="checkbox"/> raw data, <input type="checkbox"/> calculation, <input type="checkbox"/> QC data, and <input type="checkbox"/> reports? If no, please comment:			
Are audits on data reduction procedure performed on a routine basis?			
If yes, at what frequency?			

Data Reports

Question	Yes	No	Comment
Does your agency generate data summary reports?			
If yes, please list up to three reports routinely generated, including the information requested below.			
Report Title	Distribution		Period Covered
Does your agency generate internal reports as a result of the <i>audits</i> required under 40 CFR 58, Appendix A?			
If yes, please list up to three reports routinely generated, including the information requested below.			
Report Title	Frequency		
Does your agency generate internal reports as a result of the <i>precision checks</i> required under 40 CFR 58, Appendix A?			
If yes, please list up to three reports routinely generated, including the information requested below.			
Report Title	Frequency		
Do either the audit or precision check reports indicated include a discussion of corrective actions initiated based on audit or			

Question	Yes	No	Comment
precision check results?			

Data Reporting

For the current calendar year or portion thereof which ended at least 90 calendar days prior to the receipt of this questionnaire, please provide the following percentages for required data submitted on time.

Period covered: _____

Percent Submitted on Time*							
Monitoring Qtr.	SO ₂	CO	O ₃	NO ₂	PM ₁₀	PM _{2.5}	Pb
1 (Jan 1 - March 31)							
2 (Apr 1 - June 30)							
3 (July 1 - Sept. 30)							
4 (Oct.1 - Dec. 31)							

*"On time" = within 90 calendar days after the end of the quarter in which the data were collected.

For the same period, what fraction of the stations (by pollutant) reported less than 75% of the data (adjusted for seasonal monitoring and site start-ups and terminations)?

Period covered: _____

Percent of Stations <u><75% Data Recovery</u>							
Monitoring Qtr.	SO ₂	CO	O ₃	NO ₂	PM ₁₀	PM _{2.5}	Pb
1 (Jan 1 - March 31)							
2 (Apr 1 - June 30)							
3 (July 1 - Sept. 30)							
4 (Oct.1 - Dec. 31)							

DATA AND DATA MANAGEMENT For PM Weighing Lab Data

State/Local/Tribal Agency Audited:

Auditor / Agency:

Key Individuals

PM Weigher(s):

Data Manager:

Data Supervisor:

Data Validator(s):

Quality Assurance Manager:

Overview of Data Flow

Question	Yes	No	Comment
Is there a procedure, description, or a chart which shows a complete data sequence from point of acquisition to point of submission of data to EPA? If yes, please attach. If no, please include one in the space below.			
Data flow diagram:			
Are procedures for data handling (e.g., data transfer, storage, etc.) documented? If yes, list documentation in comments.			If yes, indicate document where such criteria can be found (title, revision date).

Raw Data

Question	Yes	No	Comment
What is the data processing location for data received from the PM lab? Office/Lab: Computer/server:			
In what media (e.g., diskette, data cartridge, or telemetry) and formats do data arrive at the data processing location? Please list below.			
Category of Data (by Pollutant)	Data Media and Formats		
PM ₁₀			
PM _{2.5}			
How often are data received at the data processing location from the PM lab?			
How are data entered to the computer/server at the data processing location (e.g., computerized transcription (copy from disk or data transfer device), manual entry, digitization of strip charts, or other)?			
For manual data, is a double-key entry system used?			
Once uploaded to the data processing center:			

Question	Yes	No	Comment
What database(s) is/are data uploaded into for storage? What is the format of data in the database? What database(s) is/are used to view and/or edit data?			
What dataset is considered the raw dataset, representing data from the field before it is edited? How are these data protected? Who has access to the raw data? How is access by others prevented?			
How is the raw dataset backed up? How often is the raw dataset backed up?			
Are raw data submitted to other databases such as state databases? If yes, list in comments.			

Data Validation

Question	Yes	No	Comment
Has your agency established and documented the validation criteria?			If yes, indicate document where such criteria can be found (title, revision date).
Does documentation exist on the identification and applicability of flags (i.e., identification of suspect values) within the data as recorded with the data in the computer files? If yes, who are these flagging documents available to? (please check all that apply) <input type="checkbox"/> Field operators <input type="checkbox"/> Weigher(s) <input type="checkbox"/> Data validator(s) <input type="checkbox"/> Data supervisor <input type="checkbox"/> Data manager			
Does your agency document the data validation criteria including limits for values such as flow rates, calibration results, or range tests for ambient measurements? If yes, who are these validation criteria documents available to? (please check all that apply) <input type="checkbox"/> Field operators <input type="checkbox"/> Weigher(s) <input type="checkbox"/> Data validator(s)			

Question	Yes	No	Comment
<input type="checkbox"/> Data supervisor <input type="checkbox"/> Data manager			
Review by Field Operators: Do field operators review any data?			If yes, indicate which data.
How are data issues from the field operators communicated to the data validator(s)? When is this done? What information is included?			
Review by Weighers: Do weighers review any data?			If yes, indicate which data.
How are data issues from the weighers communicated to the data validator(s)? When is this done? What information is included?			
First Level Data Validation (i.e., done by validator(s) at data processing location): When does the first level of data validation occur (e.g., daily, weekly, monthly)? By whom? Describe the process of this data review: What action is taken by the data validator if he/she finds data that does not meet data validation criteria (e.g., data flagged, modified, deleted, etc.)?			
Second Level Data Validation: When does the second level of data validation occur (e.g., daily, weekly, monthly)? By whom? Describe the process of this data review: What action is taken by the reviewer if he/she finds data that does not meet data validation criteria (e.g., data flagged, modified, deleted, etc.)?			
Third Level Data Validation: Does a third level of data validation occur? If so, when? By whom? Describe the process of this data review:			

Question	Yes	No	Comment
What action is taken by the reviewer if he/she finds data that does not meet data validation criteria (e.g., data flagged, modified, deleted, etc.)?			
Additional Data Review: Describe any additional data review that occurs.			
What criteria are used to determine that a data point be deleted? Discuss briefly.			
What criteria are used to determine if data need to be reprocessed? Discuss.			

Data Correction and Submittal

Question	Yes	No	Comment
At what stage(s) in the data review process are changes to the database implemented? By whom? Where is the basis for the data changes recorded? Who has final approval authority for changes? Is the raw dataset overwritten or is a new dataset generated? If the raw dataset is overwritten, describe where the original dataset is archived.			
Are concentrations of pollutants other than PM _{2.5} corrected to EPA standard temperature and pressure conditions (i.e., 298EK, 760 mm Hg) before input to AQS, and concentrations of PM _{2.5} reported to AQS under actual (volumetric) conditions?			
When are data routinely submitted to AQS?			
Please describe how changes made to data that were submitted to AQS are documented.			
Who has signature authority for approving corrections to AQS?			

Question	Yes	No	Comment
Are corrected data resubmitted to the issuing group for cross-checking prior to release?			
Does your agency have information on the reporting of precision and accuracy data available?			
Are data precision and accuracy checked each time they are calculated, recorded, or transcribed to ensure that incorrect values are not submitted to EPA?			
Data Certification: Are data certified?			
<p>Who prepares the data certification package?</p> <p>Who reviews the data certification package?</p> <p>Who signs the data certification package?</p> <p>What data are included (e.g., SLAMS, SPM, Toxics, etc.)?</p>			

Data Backup

Question	Yes	No	Comment
List points at which data are backed up and method of backup:			
What is the recovery capability in the event of a significant computer problem (i.e., how much time and data would be lost)?			
Has any significant loss of data occurred within the past three years due to data management issues? If yes, please describe in comments.			

Software

Question	Yes	No	Comment
Does your agency use an AQS Manual?			If yes, list the title, version number, and date published.
What are the origins of the software used to prepare air monitoring data for release into the AQS database? Please list the documentation for the software currently in use for data processing, including the names of the software packages, vendor or			

Question	Yes	No	Comment
author, revision numbers, and the revision dates of the software.			
Has your agency tested the data processing software to ensure its performance of the intended function are consistent with the QA Handbook, Volume II, and Section 14.0?			
Does your agency document software tests?			
If yes, provide the documentation			

Record-keeping and Data Audits

Question	Yes	No	Comment
Are records kept for at least 3 years by the agency in an orderly, accessible form?			
If yes, does this include: <input type="checkbox"/> raw data, <input type="checkbox"/> calculation, <input type="checkbox"/> QC data, and <input type="checkbox"/> reports? If no, please comment:			
Are audits on data reduction procedure performed on a routine basis?			
If yes, at what frequency?			

Data Reports

Question	Yes	No	Comment
Does your agency generate data summary reports?			
If yes, please list up to three reports routinely generated, including the information requested below.			
Report Title	Distribution		Period Covered
Does your agency generate internal reports as a result of the <i>audits</i> required under 40 CFR 58, Appendix A?			
If yes, please list up to three reports routinely generated, including the information requested below.			
Report Title	Frequency		
Does your agency generate internal reports as a result of the <i>precision checks</i> required under 40 CFR 58, Appendix A?			
If yes, please list up to three reports routinely generated, including the information requested below.			
Report Title	Frequency		
Do either the audit or precision check reports indicated include a discussion of corrective actions initiated based on audit or			

Question	Yes	No	Comment
precision check results?			

Data Reporting

For the current calendar year or portion thereof which ended at least 90 calendar days prior to the receipt of this questionnaire, please provide the following percentages for required data submitted on time.

Period covered: _____

Percent Submitted on Time*							
Monitoring Qtr.	SO ₂	CO	O ₃	NO ₂	PM ₁₀	PM _{2.5}	Pb
1 (Jan 1 - March 31)							
2 (Apr 1 - June 30)							
3 (July 1 - Sept. 30)							
4 (Oct.1 - Dec. 31)							

*"On time" = within 90 calendar days after the end of the quarter in which the data were collected.

For the same period, what fraction of the stations (by pollutant) reported less than 75% of the data (adjusted for seasonal monitoring and site start-ups and terminations)?

Period covered: _____

Percent of Stations <u><75% Data Recovery</u>							
Monitoring Qtr.	SO ₂	CO	O ₃	NO ₂	PM ₁₀	PM _{2.5}	Pb
1 (Jan 1 - March 31)							
2 (Apr 1 - June 30)							
3 (July 1 - Sept. 30)							
4 (Oct.1 - Dec. 31)							

FIELD OVERVIEW – complete with/by Monitoring Manager

State/Local/Tribal Agency Audited:

Auditor / Agency:

Key Individuals

Ambient Air Monitoring Field Operations Manager:

Site Operators

Name	Site(s)

On average, how often are most of your stations visited by a field operator?

Sampling Lines

Question	Yes	No	Comment
How many of the stations of your SLAMS/NCORE network are equipped with sampling manifolds?			
Do the sample inlets and manifolds meet the requirements for through the probe audits?			
Briefly describe most common manifold type			
Are manifolds cleaned periodically			How often?
If the manifold is cleaned, what is used to perform cleaning			
Are manifold(s) equipped with a blower			
Is there sufficient air flow through the manifold at all times?			Approximate air flow:
How is the air flow through the manifold monitored?			
Is there a conditioning period for the manifold after cleaning?			Length of time:
What is the typical residence time?			
Does residence time exceed 20 s at any sites? If yes, list site(s) and pollutant(s)			
Sampling lines: 1) What material is used for instrument sampling lines?			
2) How often are lines changed?			
Do you utilize uninterruptable power supplies or backup power sources at your sites?			
What instruments or devices are protected?			

Site Power

Question	Yes	No	Comment
Do any sites experience power issues? If yes, list in comments.			
Do you utilize uninterruptable power supplies or backup power sources at your sites?			
What instruments or devices are protected?			

SOPs

Question	Yes	No	Comment
Is the documentation of monitoring SOPs complete?			
Are any new monitoring SOPs needed?			
Are such procedures available to all field operations personnel?			
How are SOPs made available to field personnel?			
Are SOPs that detail operations during episode monitoring prepared and available to field personnel?			
Are SOPs based on the framework contained in Guidance for Preparing Standard Operating Procedures EPA QA/G-6?			

Pollutant Monitored	Date of Last SOP Review	Date of Last SOP Revision
SO ₂		
NO ₂		
CO		
O ₃		
PM ₁₀		
PM _{2.5} FRM mass		
Pb		
PM _{2.5} speciation		
PM _{10-2.5} FRM mass		
PM _{10-2.5} speciation		
Continuous PM _{2.5} mass		
Trace levels (CO)		
Trace levels (SO ₂)		
Trace levels (NO)		
Trace levels (NO _y)		
Total reactive nitrogen		
Surface Meteorology		

Wind speed and direction, temperature, RH, precipitation and solar radiation		
Others		

Record Keeping

Question	Yes	No	Comment
What type of station logbooks are maintained at each monitoring station? (e.g, maintenance logs, calibration logs, personal logs, etc.)			
What information is included in the station logbooks?			
Who reviews and verifies the logbooks for adequacy of station performance?			
How is control of logbook maintained?			
Where is the completed logbook archived?			
What other records are used?			
Zero span record?			
Gas usage log?			
Maintenance log?			
Log of precision checks?			
Control charts?			
A record of audits?			
Please describe the use and storage of these documents.			
Are calibration records or at least calibration constants available to field operators?			
Please attach an example field calibration record sheet to this questionnaire.			

State/ Local / Tribal Agency Audited:

Address:

City, State, and Zip Code:

Date of Technical System Audit:

Auditor / Agency:

1) General / Quality Management

a) Program Organization

List Key Managers:

	Name	Agency Title
Agency Director		
Ambient Air Monitoring (AAM) Network Manager		
Quality Assurance Manager		
Field Operations Supervisor / Lead		
Laboratory Supervisor		
QA Laboratory Manager		
Data Management Supervisor / Lead		

List Key Staff:

	Name	Division/Branch
Network Design and Siting		
QC Activities		
QA Activities		
QA Auditors		
Equipment Repair and Maintenance		

Site Operation		
Data and Data Management		
Training		
Financial Management		
Equipment and Service Contract Management		
Purchases > \$500		
Grant Management		

List your district offices and associated staff below (State Agencies Only)		
Name	Address (City)	Staff

<p>Comment on the need for additional personnel, if applicable</p>
--

Attach an Organizational Chart :

- Are there vacancies? If so, what is the status?

Contractors and Suppliers

Questions	Yes	No	Comments
Does your agency utilize any contractors in your air monitoring program? If no, skip to the next table.			
Who is responsible for oversight of contract personnel?			
What steps are taken to ensure contract personnel meet training and experience criteria?			
Does the contractor follow an EPA approved QAPP?			
- Where/how is this documented?			
How often are contracts reviewed and/or renewed?			

b) Facilities

Identify the principal facilities where the agency conducts work that is related to air monitoring. Do not include monitoring stations but do include facilities where work is performed by contractors or other organizations.		
Facility AAM Function	Location	Is Space Adequate?
General office space		
Data verification and processing		
Criteria gas instrument maintenance and storage		
Certification of standards e.g. gases, flow transfers, MFC		
Instrument repair		
PM filter weighing		
Long-term storage		
Short-term storage		
Air toxics (Carbonyls, VOC s, Metals):		
Indicate any facilities that should be upgraded. Identify by function and any suggested improvements or recommendations.		
Are facilities adequate concerning safety? Yes / No Please explain if answer is no any suggested improvements or recommendations.		
Are monitoring sites ever used for storage of equipment, spare parts, or supplies?		

Are there any significant changes which are likely to be implemented to agency facilities within the next one to two years? Comment on agency's needs for additional physical space (laboratory, office, storage, etc.).

Facility	Function	Proposed Change - Date

c) Independent Quality Assurance and Quality Control

1. Status of Quality Assurance Program

Question	Yes	No	Comment
Has the agency documented and implemented specific audit procedures separate from monitoring procedures?			
Are there two levels of management separation between QA (e.g., auditors) and QC (e.g., site operators) operations? Please explain:			
Does the agency have identifiable auditing equipment and standards (specifically intended for sole use) for audits?			

2. QC Checks

Select which of the following QC you conduct at your gaseous sites				
Precision Checks	Typically Performed?	How?		Frequency
		Manually (by whom?)	Automated	
Precision Point				
Zero Precision Span				
Zero Precision				
Probe Line Integrity Checks				
Other: _____				

3. Internal Performance Audits

Question	Yes	No	Comment
Does the agency have separate facilities to support audits and calibrations?			
If the agency has in place contracts or similar agreements either with another agency or contractor to perform audits or calibrations, please name the organization and briefly describe the type of agreement.			
Does the agency have a performance audit SOP?			
Does the agency maintain independence of audit standards and personnel?			

Do any site operators ever audit their own sites?			
Does the agency have a certified source of zero air for performance audits?			
How do you generate your zero air?			
Does the agency have procedures for auditing and/or validating performance of Meteorological monitoring?			
Is audit equipment ever used to support routine calibration and QC checks required for monitoring network operations?			
If yes, please describe.			
Are standard operating procedures (SOPs) for air monitoring available to all field personnel?			
Has the agency established and has it documented criteria to define agency-acceptable audit results?			

Please complete the table below with the pollutant, monitor and acceptance criteria			
Pollutant	Action Level	Corrective Action (if exceeded)	How is performance tracked?
O ₃			
CO			
NO ₂			
SO ₂			
PM ₁₀			
PM _{2.5}			
Pb			
Continuous PM _{2.5}			
Continuous PM ₁₀			
Trace Levels (CO)			
Trace Levels (SO ₂)			
Trace Levels (NO)			
Trace Levels (NO _y)			
Surface Meteorology			

Others			
At what point do you invalidate data?			

Question	Yes	No	Comment
Were these audit criteria based on, or derived from, the guidance found in Volume II of the QA Handbook for Air Pollution Measurement System, Section 2.0.12?			<p>If no, please explain.</p> <p>If yes, please explain any changes or assumptions made in the derivation.</p>
<p>What corrective action may be taken if criteria are exceeded? If possible, indicate two examples of corrective actions, taken within the period since the previous systems audit which are based directly on the criteria discussed above.</p> <p>Corrective Action # 1</p> <p>Corrective Action #2</p>			

Question	Yes	No	Comments
Are your sites regularly reviewed for Appendix E siting criteria?			Frequency:
Do you conduct internal system and/or data audits of your air monitoring agency?			
(1) How frequently?			
(2) Describe audits			
(3) Who receives the results of these audits?			
(4) Do you report these results to EPA?			

Question	Yes	No	Comments
Are internal annual performance audits for gaseous criteria pollutants conducted?			Frequency:
Who conducts these audits?			
Are internal semi-annual flow audits for both PM _{2.5} and PM ₁₀ conducted?			Frequency: Time between audits:
Who conducts these audits?			

4. External Performance Audits

Question	Yes	No	Comments
Does your agency participate in NPAP, PM _{2.5} PEP, Pb PEP and other performance audits performed by an external party and/or using external standards?			
If the agency does not participate, please explain why:			
Who performs the NPAP and PEP audits?	NPAP: PM _{2.5} PEP: Pb PEP:		
Is your agency audited by the State (if you are a local agency)?			
(1) How frequently?			
(2) What type of audit is conducted (e.g., performance or systems audit)?			
(3) Who receives the results of these audits?			
(4) Do you report these results to EPA?			

d) Planning Documents including QMP, QAPPs, & SOPs

QMP Questions	Yes	No	Comments
Has the QMP been approved by EPA within the last five years?			Date of Original Approval: Date of Last Revision: Date of Last Approval:
QAPP Questions	Yes	No	Comments
Has the QAPP been reviewed by EPA recently?			Date of Original Approval: Date of Last Revision: Date of Last Approval:
Does the State review your QAPP prior to EPA review? (local agencies only)			
Does your agency have any revisions to your QAPP pending?			
How does the agency verify the QAPP is fully implemented?			
How is the QAPP available to the staff (e.g., electronically, hard copies at site, etc.)			
SOP Questions	Yes	No	Comments
How does the agency verify that the SOPs are implemented as provided (e.g., staff are regularly observed for correct implementation of SOPs)?			
How are revisions to the SOP distributed?			
How are SOPs available to the staff (e.g., electronically, hard copies at site, etc.)			
Are any new monitoring SOPs needed? If yes, please list in comments section.			

e) General Document Policies

Question	Yes	No	Comment
Does the agency have a documented records management plan?			
Does the agency have a list of files considered official records and their media type (i.e., paper, electronic)?			
Does the agency have a schedule for retention and disposition of records?			
Are records for at least three years?			
Who is responsible for the storage and retrieval of records?			
What security measures are utilized to protect records?			
Where/when does the agency rely on electronic files as primary records?			
What is the system for the storage, retrieval and backup of these files?			

f) Training

Question	Yes	No	Comment
Does the agency have a training program and training plan?			
Where is it documented?			
Does it make use of seminars, courses, EPA sponsored college level courses?			
Are personnel cross-trained for other ambient air monitoring duties?			
Are training funds specifically designated in the annual budget?			
Does the training plan include:	Yes	No	Comment
1. Training requirements by position			
2. Frequency of training			
3. Training for contract personnel			
4. A list of core QA related courses			

Indicate below the three most recent training events and identify the personnel participating in them.		
Event	Dates	Participant(s)

g) Corrective Action

Question	Yes	No	Comments
Does the agency have a comprehensive corrective action program in place?			
Have the procedures been documented?			
1. As a part of the QA project plan?			
2. As a separate standard operating procedure?			
Does the agency have established and documented corrective action limits for QA and QC activities?			
Are procedures implemented for corrective actions based on results of the following which fall outside of established limits:			
1. Performance Evaluations			
2. Precision Goals			
3. Bias Goals			
4. NPAP Audits			
5. PEP Audits			
6. Validation of one point QC Check Goals			
7. Completeness Goals			
8. Data Audits			
9. Calibrations and Zero Span Checks			
10. Technical Systems Audit			
Have the procedures been documented?			
How is responsibility for implementing corrective actions assigned? Briefly discuss.			
How does the agency follow up on implemented corrective actions?			
Briefly describe recent examples of the ways in which the above corrective action system was employed to remove problems.			

h) Quality Improvement

Question	Yes	No	Comment
Have all deficiencies indicated on the previous TSA been corrected?			
If not explain.			
What actions were taken to improve the quality system since the last TSA?			
Since the last TSA do your performance indicators show that the overall data quality for each pollutant steady or improving?			
Are there areas where data quality appears to be declining? If so not possible causes in comment section.			
Are there pending plans for quality improvement such as purchase of new or improved equipment, standards, or instruments?			

INSTRUMENT CERTIFICATION/TESTING

State/Local/Tribal Agency Audited:

Auditor / Agency:

Key Individuals

Key Manager and/or Staff for Certification/Testing:

Instrument Acceptance

Has your agency obtained necessary waiver provisions to operate equipment which does not meet the effective reference and equivalency requirements? List all waivers.

Please list instruments in your inventory if these are not in the Annual Network Plan

Pollutant	Number	Make and Models	Reference or Equivalent number
SO ₂			
NO ₂			
CO			
O ₃			
PM ₁₀			
PM _{2.5}			
Pb			
Multi gas calibrator			
PM _{2.5} speciation			
PM _{10-2.5} speciation			
PM _{10-2.5} FRM mass			
Continuous PM _{2.5} mass			
Trace levels (CO)			
Trace levels (SO ₂)			
Trace levels (NO)			
Trace levels (NO _y)			
Surface Meteorology			
Others			

Please comment briefly and prioritize your currently identified instrument needs.

Question	Yes	No	Comment
Are criteria established for field QC equipment?			
Are criteria established for field QC gas standards?			
Is there a testing procedure for new instruments? If yes, describe in comments.			

INSTRUMENT REPAIR

State/Local/Tribal Agency Audited:

Auditor / Agency:

Key Individuals

Key Manager and/or Staff for Repairs:

Who is responsible for performing preventive maintenance?

Is special training provided them for performing preventive maintenance? Briefly comment on background or courses.

Is this training routinely reinforced? Yes ____ No ____
If no, why not?

What is your preventive maintenance schedule for each type of field instrumentation?

If preventive maintenance is MINOR, it is performed at (check one or more): field station ____, headquarters facilities ____, equipment is sent to manufacturer ____

If preventive maintenance is MAJOR, it is performed at (check one or more): field station ____, headquarters facilities ____, equipment is sent to manufacturer ____

Does the agency have service contracts or agreements in place with instrument manufacturers? Indicate below or attach additional pages to show which instrumentation is covered?

Comment briefly on the adequacy and availability of the supply of spare parts, tools and manuals available to the field operator to perform any necessary maintenance activities. Do you feel that this is adequate to prevent any significant data loss?

Is the agency currently experiencing any recurring problem with equipment or manufacturer(s)? If so, please identify the equipment or manufacturer, and comment on steps taken to remedy the problem.

Have you lost any data due to repairs in the last 2 years?

More than 24 hours?

More than 48 hours?

More than a week?

Explain any situations where instrument down time was due to lack of preventive maintenance or unavailability of parts.

NETWORK MANAGEMENT

State/Local/Tribal Agency Audited:

Auditor / Agency:

Key Individuals

Ambient Air Monitoring Network Manager:

Staff Responsible for Preparation of Annual Network Plan:

Other Staff Involved in Network Planning:

Current Network

Complete the table below for each of the pollutants monitored as part of your air monitoring network within the past year. (Record applicable count by category.) Also indicate seasonal monitoring with an S for a Parameter/Category as appropriate.									
Category*	SO ₂	NO ₂	CO	O ₃	PM ₁₀	PM _{2.5}	Pb	Other (type)	Other (type)
NCore									
SLAMS									
SPM									
PAMS									
Total									

*NCore - National Core monitoring stations; SLAMS - state and local air monitoring stations; SPM - special purpose monitors; PAMS - photochemical assessment monitoring stations

Network Planning Documents

Question	Yes	No	Comment
What is the date of the most recent network assessment? (Provide copy)			
Is the Annual Network Plan complete and up-to-date? (Provide copy) If no, indicate status and skip to next set of questions.			
What is the date of the most current network plan?			
Was the network plan made available for public inspection?			
Does the network plan include the information required for each site?			
AQS Site ID #			
Street address and geographic coordinates			
Sampling and Analysis Method(s)			
Operating Schedule			
Monitoring Objective and Scale of Representativeness			
Site suitable/not suitable for comparison to annual PM _{2.5} NAAQS?			
MSA, CBSA or CSA indicated as required?			

Does the network plan include proposed changes to the network?			
Who has custody of the network plan?			

Non-conformance of Monitors

Indicate by Site ID # any non-conformance with the requirements of 40 CFR 58, Appendices D and E, along with any waivers granted by the Regional Office (provide waiver documentation)			
Monitor	Site ID	Reason for Non-Conformance	Waiver?
SO ₂			
O ₃			
CO			
NO ₂			
PM ₁₀			
PM _{2.5}			
Pb			

Are there any sites that are not currently meeting the requirements of 40 CFR 58? _____
 If yes, please describe.

Previous Network Changes

Please provide information on any site changes since the last audit					
Pollutant	Site ID	Site Address	Site Added/Deleted/Relocated	Reason (Assessment, lost lease, etc. Provide documentation of reason for each site change.)	Approved by EPA?

Proposed Network Changes

Are future network changes proposed?				
Please provide information on proposed site changes, including documentation of the need for the change and any required approvals				
Pollutant	Site ID	Site Address	Site to be Added/Deleted/Relocated	Reason (Assessment, lost lease, etc. Provide documentation of reason for each site change.)

--	--	--	--	--

Field Support – Field Auditor complete in the field with site operator

Site/Monitor Information Form

PQAO _____

AQS Site Name _____

AQS Site Number _____

Agency Site Name/No. _____
(if different than AQS Site Name/Number)

Site Address _____

City & County _____

Site Coordinates _____
(specify lat/long or UTM)

Site Elevation (m) _____

Criteria Pollutants Monitored _____

Other Parameters _____

Nearst Meterological Site _____
(‘on site’ is met tower present at this site)

Photographs to and from each cardinal direction attached? _____
(Yes or No)

Name(s) of Report Preparer(s) _____

Name(s) of Auditors _____

Date _____

Phone Number _____

General Field site questions

Question	Yes	No	Comment
On average, how often do you visit this field station?			_____ per _____
How many stations do you have responsibility for?			
Is this station equipped with a sampling manifold?			
Do the sample inlets and manifolds meet the requirements for through the probe audits?			
I. Briefly describe the manifold type			
II. Is the manifolds cleaned periodically?			How often?
III. If the manifold is cleaned, what is used to perform cleaning?			
IV. Is manifold equipped with a blower?			
V. Is there sufficient air flow through the manifold at all times?			Approximate air flow:
VI. How is the air flow through the manifold monitored?			
VII. Is there a conditioning period for the manifold after cleaning?			Length of time:
VIII. What is the residence time?			
Sampling lines: 1) What material is used for instrument sampling lines?			
2) How often are lines changed?			
Do you utilize uninterruptable power supplies or backup power sources at your sites?			
What instruments or devices are protected?			

i). SOPs

Please complete the following table:

Pollutant Monitored	Date of Last SOP Revision	Where is the SOP stored in the field?
SO ₂		
NO ₂		
CO		
O ₃		
PM ₁₀		
PM _{2.5} FRM mass		
Pb		
PM _{2.5} speciation		

Please identify station standards for gaseous pollutants at representative air monitoring stations (attach additional sheets as appropriate):

Parameter	Station(s)	Identification of Standard(s)	Recertification Date(s)
CO			
NO ₂			
SO ₂			
O ₃			

iv) Repair

- Who is responsible for performing preventive maintenance?
- Is special training provided for performing preventive maintenance? Briefly comment on background or courses.
- Is this training routinely reinforced? Yes ___ No ___
If no, why not?
- What is your preventive maintenance schedule for each type of field instrumentation?
- If preventive maintenance is MINOR, it is performed at (check one or more): field station ___, headquarters facilities ___, equipment is sent to manufacturer
- If preventive maintenance is MAJOR, it is performed at (check one or more): field station ___, headquarters facilities ___, equipment is sent to manufacturer
- Does the agency have service contracts or agreements in place with instrument manufacturers? Indicate below or attach additional pages to show which instrumentation is covered?
- Comment briefly on the adequacy and availability of the supply of spare parts, tools and manuals available to the field operator to perform any necessary maintenance activities. Do you feel that this is adequate to prevent any significant data loss?
- Is the agency currently experiencing any recurring problem with equipment or manufacturer(s)? If so, please identify the equipment or manufacturer, and comment on steps taken to remedy the problem.
- Have you lost any data due to repairs in the last 2 years?
More than 24 hours?
More than 48 hours?
More than a week?
- Explain any situations where instrument down time was due to lack of preventive maintenance or unavailability of parts.

RECORD KEEPING

Question	Yes	No	Comment
What type of station logbooks are maintained at each monitoring station? (maintenance logs, calibration logs, personal logs, etc.)			
What information is included in the station logbooks?			
Who reviews and verifies the logbooks for adequacy of station performance?			
How is control of logbook maintained?			
Where is the completed logbook archived?			
What other records are used?			
Zero span record?			
Gas usage log?			
Maintenance log?			
Log of precision checks?			
Control charts?			
A record of audits?			
Please describe the use and storage of these documents.			
Are calibration records or at least calibration constants available to field operators?			
Please attach an example field calibration record sheet to this questionnaire.			

Monitor Information

Pollutants

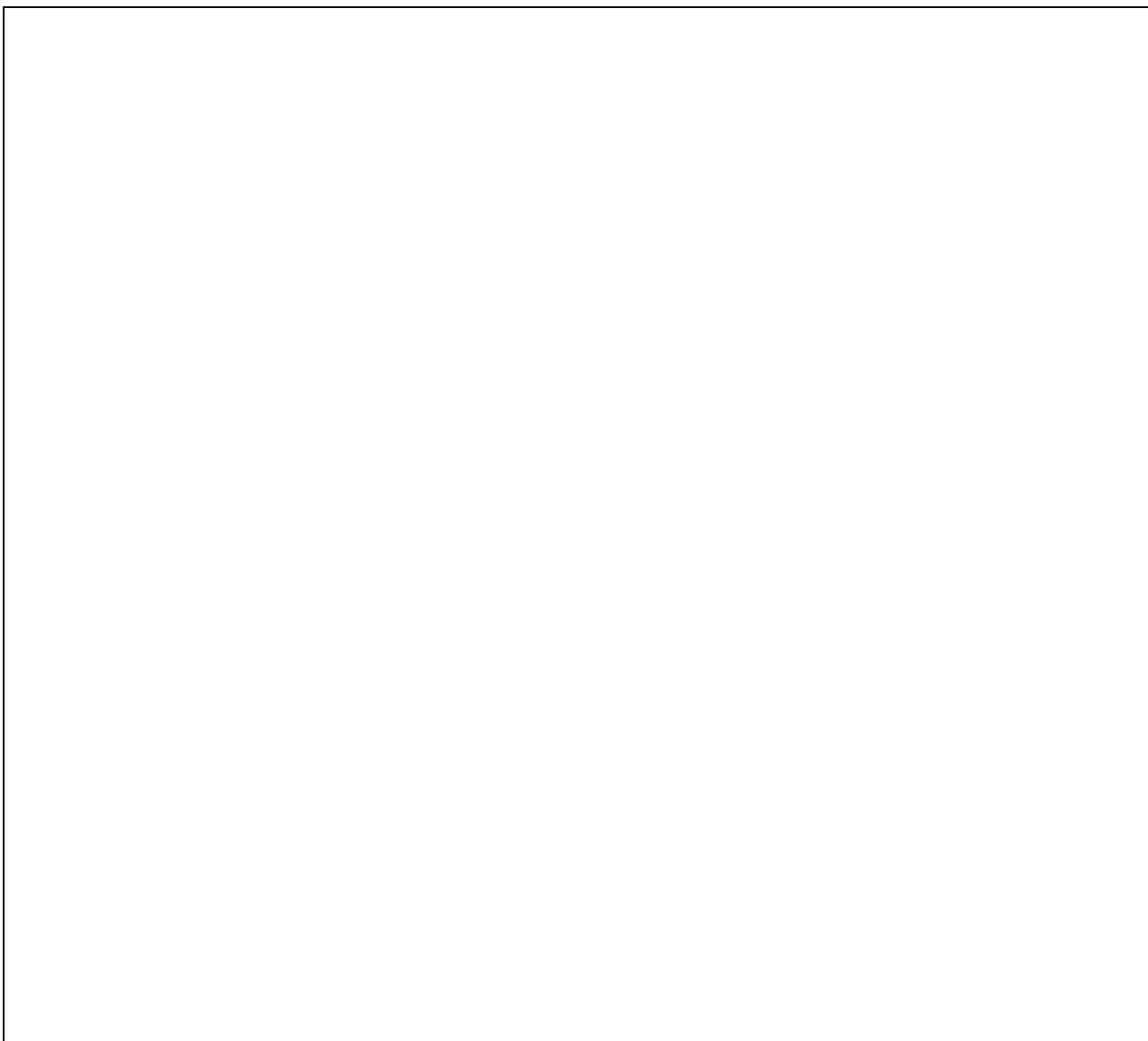
Manufacturer			
Model			
Serial number			
Scale of representation MICro, MIDdle, Neighborhoo <u>d</u> , Urban			
Objective (Population, Max concentration, Background, Transport)			
Height of probe above ground(m)			
Distance from obstruction (m)			
Type of obstruction (Wall, Tree, etc)			
Distance from roadway (m)			
Unrestricted airflow (Yes, No)			
Designation (NCore, SLAMS,etc)			
Siting Criteria Met (Yes, No)			

Manufacturer			
Model			
Serial number			
Scale of representation MICro, MIDdle, Neighborhoo <u>d</u> , Urban			
Averaging time 1-, 8-, 24-hour			
Objective (Population, Max concentration, Background, Transport)			
Height of probe above ground(m)			
Distance from obstruction (m)			
Type of obstruction (Wall, Tree, etc)			
Distance from roadway (m)			
Unrestricted airflow (Yes, No)			
Designation (NCore, SLAMS,etc)			
Siting Criteria Met (Yes, No)			

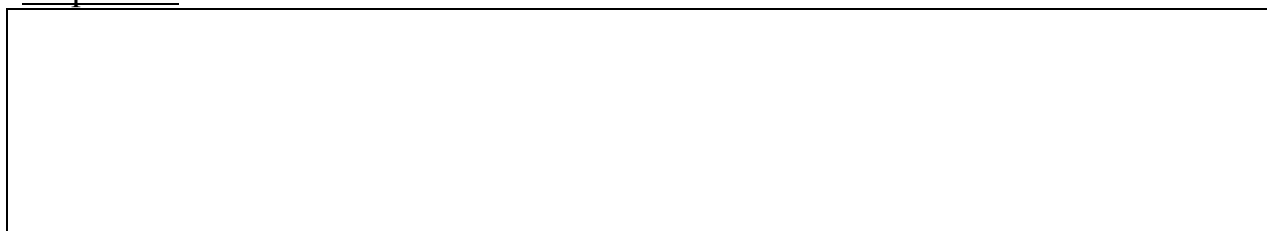
Insert additional copies of table as needed

Site Map

Draw map of site and surrounding terrain and features, up to 100 meters.

A large, empty rectangular box with a thin black border, intended for drawing a site map. It occupies the central portion of the page.

Map notes

A rectangular box with a thin black border, intended for writing map notes. It is positioned below the site map drawing area.

Area Information

Street Name	Traffic Count (Vehicles/day)

Direction	Predominant Land Use (Industry, Residential, Commercial or Agriculture)
North	
East	
South	
West	

Direction	Obstructions	Height (m)	Distance (m)
North			
East			
South			
West			

Note: This table is for large obstructions that affect the entire site, such as large clusters of trees or entire buildings. Individual obstructions, such as walls, single trees, other monitors, etc, should be entered in the Monitor Information table.

Direction	Topographic Features (hills, valleys, rivers, etc.)	General Terrain (flat, rolling, rough)
North		
East		
South		
West		

Comments

Monitor Information

Pollutants

Manufacturer			
Model			
Serial number			
Scale of representation MICro, MIDdle, Neighborhood, Urban			
Objective (Population, Max concentration, Background, Transport)			
Height of probe above ground(m)			
Distance from obstruction (m)			
Type of obstruction (Wall, Tree, etc)			
Distance from roadway (m)			
Unrestricted airflow (Yes, No)			
Designation (NCore, SLAMS,etc)			
Siting Criteria Met (Yes, No)			

Manufacturer			
Model			
Serial number			
Scale of representation MICro, MIDdle, Neighborhood, Urban			
Averaging time 1-, 8-, 24-hour			
Objective (Population, Max concentration, Background, Transport)			
Height of probe above ground(m)			
Distance from obstruction (m)			
Type of obstruction (Wall, Tree, etc)			
Distance from roadway (m)			
Unrestricted airflow (Yes, No)			
Designation (NCore, SLAMS,etc)			
Siting Criteria Met (Yes, No)			

Insert additional copies of table as needed

Monitor Information

Pollutants

Manufacturer			
Model			
Serial number			
Scale of representation MICro, MIDdle, Neighborhood, Urban			
Objective (Population, Max concentration, Background, Transport)			
Height of probe above ground(m)			
Distance from obstruction (m)			
Type of obstruction (Wall, Tree, etc)			
Distance from roadway (m)			
Unrestricted airflow (Yes, No)			
Designation (NCore, SLAMS,etc)			
Siting Criteria Met (Yes, No)			

Manufacturer			
Model			
Serial number			
Scale of representation MICro, MIDdle, Neighborhood, Urban			
Averaging time 1-, 8-, 24-hour			
Objective (Population, Max concentration, Background, Transport)			
Height of probe above ground(m)			
Distance from obstruction (m)			
Type of obstruction (Wall, Tree, etc)			
Distance from roadway (m)			
Unrestricted airflow (Yes, No)			
Designation (NCore, SLAMS,etc)			
Siting Criteria Met (Yes, No)			

Insert additional copies of table as needed

STANDARDS AND CALIBRATIONS

State/Local/Tribal Agency Audited:

Auditor / Agency:

Key Individuals

Key Manager and/or Staff for Standards/Calibrations:

Please indicate the frequency of multi point calibrations.		
Pollutant	Frequency	Name of Calibration Method

What triggers an unscheduled calibration?

Question	Yes	No	Comment
Are field calibration procedures included in the document? SOPs?			Location (site, lab etc.):
Are calibrations performed in keeping with the guidance in section Vol II of the QA Handbook for Air Pollution Measurement Systems?			If no, why not?
Are calibration procedures consistent with the operational requirements of Appendices to 40 CFR 50 or to analyzer operation/instruction manuals?			If no, why not?
Have changes been made to calibration methods based on manufacturer's suggestions for a particular instrument?			
Do standard materials used for calibrations meet the requirements of appendices to 40 CFR 50 (EPA reference methods) and Appendix A to 40 CFR 58 (traceability of materials to NIST-SRMs or CRMs)?			Comment on deviations
Are all flow-measurement devices checked and certified?			
Additional comments:			
Please list the authoritative standards used for each type of flow measurement, indicate the certification frequency of standards to maintain field material/device credibility.			

Question	Yes	No	Comment
Flow Device	Primary Standard		Frequency of Certification
HiVol orifice			
Streamline			
TriCal			
BIOS			
DeltaCal			
Gilibrators			
Where do field operations personnel obtain gaseous standards?			
Are those standards certified by:			
The agency laboratory?			
EPA/NERL standards laboratory?			
A laboratory separate from this agency's but part of the same reporting organization?			
The vendor?			
Other (describe).			
How are the gas standards verified after receipt?			
How are flow measurement devices certified?			
Please provide copies of certifications of all standards currently in use from your master and/or satellite standard certification logbooks (i.e., chemical standards, ozone standards, flow standards, and zero air standards) .			
What equipment is used to perform calibrations (e.g., dilution devices) and how is the performance of this equipment verified?			
Does the documentation include expiration date of certification?			
Reference to primary standard used?			
What traceability is used?			
Please attach an example of recent documentation of traceability			
Is calibration equipment maintained at each station?			
How is the functional integrity of this equipment documented?			
Who has responsibility for maintaining field calibration standards?			
Please list the authoritative standards and frequency of each type of dilution, permeation and ozone calibrator and indicate the certification frequency...			
Calibrator	Primary Standard		Frequency of Calibration Certification

Question		Yes	No	Comment
Permeation calibrator flow controller				
Permeation calibrator temperature				
Dilution calibrator air and gas flow controllers				
Field/working standard photometer				
Ozone generator				

o) Please identify station standards for gaseous pollutants at representative air monitoring stations (attach additional sheets as appropriate):

Parameter	Station(s)	Identification of Standard(s)	Recertification Date(s)
CO			
NO ₂			
SO ₂			
O ₃			